

**CLAIMS**

We Claim:

1. A fiber comprising a plasticized polyolefin composition comprising one or more polyolefins and one of more non-functionalized plasticizers where the non-functionalized plasticizers have a kinematic viscosity ("KV") of 2 cSt or less at 100 °C.
2. The fiber of claim 1 wherein the non-functionalized plasticizer comprises at least 50 weight%, of C<sub>6</sub> to C<sub>100</sub> isoparaffins.
3. The fiber of claim 1 wherein the non-functionalized plasticizer comprises at least 50 weight% of C<sub>5</sub> to C<sub>25</sub> n-paraffins having less than 0.1 % aromatics.
4. The fiber of claim 1 wherein the non-functionalized plasticizer comprises at least 50 weight% of a dearomatized aliphatic hydrocarbon comprising a mixture of normal paraffins, isoparaffins and cycloparaffins.
5. The fiber of claim 1 wherein the non-functionalized plasticizer comprises at least 50 weight% of a dearomatized aliphatic hydrocarbon comprising a mixture of C<sub>4</sub> to C<sub>25</sub> normal paraffins, C<sub>4</sub> to C<sub>25</sub> isoparaffins and C<sub>4</sub> to C<sub>25</sub> cycloparaffins.
6. A fiber comprising a plasticized polyolefin composition comprising one or more polyolefins and one of more non-functionalized plasticizers where the non-functionalized plasticizer comprises C<sub>20</sub> to C<sub>1500</sub> paraffins having a Kinematic viscosity of 10 cSt or more at 100 °C and a viscosity index of 120 or more.
7. A fiber comprising plasticized polyolefin composition comprising one or more polyolefins and one of more non-functionalized plasticizers where

the non-functionalized plasticizer comprises oligomers of C<sub>5</sub> to C<sub>14</sub> olefins having a Kinematic viscosity of 10 cSt or more at 100 °C and a viscosity index of 120 or more.

- 5     8.     A fiber comprising plasticized polypropylene compositions comprising polypropylene and one or more non-functionalized plasticizers where the non-functionalized plasticizer comprises oligomers of C<sub>6</sub> to C<sub>14</sub> olefins having viscosity index of 120 or more, provided that when the plasticized composition comprises between 4 and 10 weight % of polyalphaolefin that  
10     is a hydrogenated, highly branched dimer of an alpha olefin having 8-12 carbon atoms, the composition does not comprises between 18 and 25 weight percent of a linear low density polyethylene having a density of 0.912 to 0.935 g/cc.
- 15     9.     A fiber comprising plasticized polypropylene compositions comprising polypropylene and one or more non-functionalized plasticizers where the non-functionalized plasticizer comprises oligomers of C<sub>6</sub> to C<sub>14</sub> olefins having viscosity index of 120 or more, provided that when the composition  
20     does not comprises an impact copolymer of polypropylene and 40-50 weight% of an ethylene propylene rubber or provided that the composition does not comprise a random copolymer of propylene and ethylene.
10.     A fiber comprising plasticized polyolefin composition comprising a polyolefin and a non-functionalized plasticizer where the plasticizer  
25     comprises a mineral oil having a saturates levels of 90% or more, sulfur contents of 0.03 % or less, and VI of 120 or more.
11.     An fiber comprising plasticized polyolefin composition comprising a polyolefin and a non-functionalized plasticizer where the plasticizer  
30     comprises a mixture of branched and normal paraffins having from 6 to 50 carbon atoms and a ratio of branch paraffin to n-paraffin ratio ranging from 0.5:1 to 9:1.

12. The fiber of claim 11 where the mixture comprises greater than 50 wt% mono-methyl species.
- 5 13. The fiber of claim 11 where the plasticizer comprises a mixture of branched and normal paraffins having from 10 to 16 carbon atoms and a ratio of branch paraffin to n-paraffin ratio ranging from 1:1 to 4:1.
- 10 14. The fiber of claim 7 wherein the non-functionalized plasticizer comprises an oligomer of decene having a carbon number of 40-200.
- 15 15. A fiber comprising a plasticized polyolefin composition comprising one or more polyolefins and one or more non-functionalized plasticizers where the non-functionalized plasticizer comprises a linear or branched paraffinic hydrocarbon composition having a number average molecular weight of 500 to 20,000, having less than 10 % sidechains having 4 or more carbons, and having at least 1 or 2 carbon branches present at 15 weight % or more, and where the NFP comprises less than 2 weight % cyclic paraffins.
- 20 16. A fiber comprising a plasticized polyolefin composition comprising one or more polyolefins and one or more non-functionalized plasticizers where the non-functionalized plasticizer has an Mn of 15,000 and an Mw of 60,000 or less and comprises: 1) a copolymer of a C<sub>4</sub> raffinate; 2) a poly(n-butene); or 3) a copolymer of at least isobutylene derived units, 1-butene derived units, and 2-butene derived units.
- 25 17. The fiber of claim 1 wherein the where the article decreases less than 1 % in weight when stored at 70 °C for 312 hours in a dry oven.
- 30 18. The fiber of claim 1, 6 7, 10, 11, or 15 where the non-functionalized plasticizer comprises 0.1 weight % or less of functional groups selected from hydroxide, aryls and substituted aryls, halogens, alkoxys,

carboxylates, esters, carbon unsaturation, acrylates, oxygen, nitrogen, and carboxyl, based upon the weight of the NFP.

- 5 19. The fiber of claim 18 the non-functionalized plasticizer has a glass transition temperature (T<sub>g</sub>) that cannot be determined or if it can be determined then the T<sub>g</sub> is less than 30°C.
- 10 20. The fiber of claim 18 where the non-functionalized plasticizer has a distillation range having a difference between the upper temperature and the lower temperature of 20 °C or less.
21. The fiber of claim 18 where the non-functionalized plasticizer has an initial boiling point greater than 110 °C.
- 15 22. The fiber of claim 18 where the non-functionalized plasticizer has a pour point of -15 °C or less.
23. The fiber of claim 18 where the non-functionalized plasticizer has a specific gravity of less than 0.86.
- 20 24. The fiber of claim 18 where the non-functionalized plasticizer has a specific gravity from 0.70 to 0.86.
- 25 25. The fiber of claim 18 where the non-functionalized plasticizer has a final boiling point of from 115°C to 500°C.
26. The fiber of claim 18 where the non-functionalized plasticizer has a weight average molecular weight between 2,000 and 100 g/mol.
- 30 27. The fiber of claim 18 where the non-functionalized plasticizer has a flash point of -30 to 350°C.

28. The fiber of claim 18 where the non-functionalized plasticizer has a dielectric constant at 20°C of less than 3.0.
- 5 29. The fiber of claim 18 where the non-functionalized plasticizer has a density of from 0.70 to 0.83 g/cm<sup>3</sup>.
30. The fiber of claim 18 where the non-functionalized plasticizer has a viscosity of from 0.5 to 20 cSt at 25°C.
- 10 31. The fiber of claim 18 where the non-functionalized plasticizer has a carbon number of from 6 to 150.
32. The fiber of claim 18 where the non-functionalized plasticizer has a carbon number of from 7 to 100.
- 15 33. The fiber of claim 18 where the non-functionalized plasticizer has a carbon number of from 10 to 30.
34. The fiber of claim 18 where the non-functionalized plasticizer has a carbon number of from 12 to 25.
- 20 35. The fiber of claim 18 where the plasticized composition has a single glass transition temperature that is below that of the polyolefin itself.
- 25 36. The fiber of claim 18 where the T<sub>g</sub> of the plasticized composition is at least 4 °C lower than that of the neat polyolefin.
37. The fiber of claim 18 where in that the T<sub>g</sub> of the plasticized composition is at least 10 °C lower than that of the neat polyolefin.
- 30 38. The fiber of claim 18 where the T<sub>g</sub> of the plasticized composition is at least 15 °C lower than that of the neat polyolefin.

39. The fiber of claim 18 where the peak melting temperature of the neat polyolefin is within 1 to 4°C of the plasticized polyolefin.
- 5 40. The fiber of claim 18 where the crystallization temperature of the neat polyolefin is within 1 to 4°C of the plasticized polyolefin.
41. The fiber of claim 1, 6, 7, 10, 11, 15 or 16 where the polyolefin comprises polypropylene or polybutene.
- 10 42. The fiber of claim 41 where the polyolefin comprises isotactic polypropylene.
43. The fiber of claim 41 where the polyolefin comprises syndiotactic polypropylene.
- 15 44. The fiber of claim 41 where the polyolefin comprises highly isotactic polypropylene.
- 20 45. The fiber of claim 41 where the polyolefin comprises a random copolymer of propylene and up to 5 weight % of ethylene.
46. The fiber of claim 41 where the polyolefin comprises an impact copolymer.
- 25 47. The fiber of claim 41 where the polyolefin further comprises an elastomer.
48. The fiber of claim 41 where the polyolefin further comprises a plastomer.
- 30 49. The fiber of claim 41 where the polyolefin has an Mw of 30,000 to 1,000,000 g/mol.

50. The fiber of claim 41 where the polyolefin has an Mw/Mn of 1.6 to 10.
51. The fiber of claim 41 where the polyolefin has a melting point (second melt) of 30 to 185 °C.
52. The fiber of claim 41 where the polyolefin has a crystallinity of 5 to 80%.
53. The fiber of claim 41 where the polyolefin has a heat of fusion between 20 to 150 J/g.
54. The fiber of claim 41 where the polyolefin has a Gardner impact strength, tested on 0.125 inch disk at 23°C of 20 in-lb to 1000 in-lb.
55. The fiber of claim 41 where the polyolefin has a 1% secant flexural modulus of from 100 MPa to 2300 MPa
56. The fiber of claim 41 where the polyolefin has a melt flow rate from 0.3 to 500 dg/min.
57. The fiber of claim 41 where the polyolefin comprises a copolymer of propylene and from 0.5 to 30 weight % of one or more comonomers selected from the group consisting of ethylene, butene, pentene, hexene, heptene, octene, nonene, decene, dodecene, 4-methyl-pentene-1, 3-methyl pentene-1, 5-ethyl-1-nonene, and 3,5,5-trimethyl-hexene-1.
58. The fiber of claim 41 wherein the polyolefin comprises propylene, from 0 to 5 weight % of a diene, and from 2 wt% to 25 wt% ethylene, based on the total weight of the polymer and has a narrow compositional distribution; a melting point (T<sub>m</sub>) of from 25°C to 120°C; a heat of fusion of from 50 J/g to 3 J/g; an Mw/Mn of from 1.5 to 5; and a melt index (MI) of less than 20 dg/min.

59. The fiber of claim 41 where the polyolefin has a tacticity index of 4 to 12.
60. The fiber of claim 41 where the polyolefin is present at 50 to 99.99 weight  
5 %, based upon the weight of the polyolefin and the non-functionalized  
plasticizer.
61. The fiber of claim 41 where non-functionalized plasticizer is present at 0.5  
to 35 weight %, based upon the weight of the polyolefin and the non-  
functionalized plasticizer.
- 10 62. The fiber of claim 41 where non-functionalized plasticizer is present at 1  
to 15 weight %, based upon the weight of the polyolefin and the non-  
functionalized plasticizer.
- 15 63. The fiber of claim 41 wherein the polyolefin is a propylene impact  
copolymer or blend comprising from 40% to 95% by weight of a  
Component A and from 5% to 60% by weight of a Component B based on  
the total weight of copolymer; wherein Component A comprises propylene  
homopolymer or copolymer, the copolymer comprising 10% or less by  
20 weight ethylene, butene, hexene or octene comonomer; and wherein  
Component B comprises propylene copolymer, wherein the copolymer  
comprises from 5% to 70% by weight ethylene, butene, hexene and/or  
octene comonomer, and from 95% to 30% by weight propylene.
- 25 64. The fiber of claim 63 wherein the refractive index of Component A and  
the refractive index of Component B are within 10 % of each other, and,  
optionally the refractive index of the non-functionalized plasticizer is  
within 20 % of Component A, Component B or both.
- 30 65. The fiber of claim 41 wherein polyethylene having a weight average  
molecular weight of from 500 to 10,000 is substantially absent and or  
wherein phthalates, adipates, trimellitate esters, and polyesters are



substantially absent.

66. An article comprising the fiber of claim 41.
- 5 67. The article of claim 66 where the article is packaging material.
68. The article of claim 66 where the article is a package.
69. The article of claim 66 where the article is a nonwoven web.
- 10 70. The article of claim 66 where the article is a fabric.
71. The fiber of claim 41 where the fiber is spunbonded.
- 15 72. The fiber of claim 41 where the fiber is meltblown.
73. The article of claim 66 where the article is a yarn.
74. The fiber of claim 41 where the fiber is a staple fiber.
- 20 75. The article of claim 66 where the article is a surgical gown or drape.
76. The article of claim 66 where the article is clothing.
- 25 77. A nonwoven article comprising polyolefin selected from polypropylene and or polybutene and a non-functionalized plasticizer where the non-functionalized plasticizer comprises C<sub>6</sub> to C<sub>1500</sub> paraffins having a kinematic viscosity of 5 cSt or more at 100 °C and a viscosity index of 120 or more.
- 30 78. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has a kinematic viscosity of 10 cSt or more at 100 °C.

79. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises comprises oligomers of C<sub>5</sub> to C<sub>14</sub> olefins.
- 5 80. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has a pour point of -5°C or less.
81. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises oligomers of C<sub>8</sub> to C<sub>12</sub> olefins.
- 10 82. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises oligomers of two or more different olefins.
83. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises oligomers of C<sub>8</sub>, C<sub>10</sub> and C<sub>12</sub> olefins.
- 15 84. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has an M<sub>n</sub> of 500 to 10,000.
- 20 85. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises an oligomer of decene having a carbon number of 40-200.
86. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises a mineral oil having a saturates levels of 90% or more, and sulfur content of 0.03 % or less.
- 25 87. The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises a mineral oil having a saturates levels of 98% or more, and sulfur content of 0.01 % or less.
- 30 88. The nonwoven article of claim 77 wherein the non-functionalized

plasticizer has a viscosity index of 130 or more.

- 5           89.    The nonwoven article of claim 77 wherein the non-functionalized plasticizer comprises a linear or branched paraffinic hydrocarbon composition having a number average molecular weight of 500 to 20,000, having less than 10 % sidechains having 4 or more carbons, and having at least 1 or 2 carbon branches present at 15 weight % or more, and where the NFP comprises less than 2 weight % cyclic paraffins.
- 10       90.    The nonwoven article of claim 77 wherein the non-functionalized plasticizer is present at 0.01 to 60 weight%, based upon the weight of the polyolefin and the non-functionalized plasticizer.
- 15       91.    The nonwoven article of claim 77 wherein the non-functionalized plasticizer is present at 3 to 50 weight%, based upon the weight of the polyolefin and the non-functionalized plasticizer.
- 20       92.    The nonwoven article of claim 77 wherein the non-functionalized plasticizer is present at 5 to 20 weight%, based upon the weight of the polyolefin and the non-functionalized plasticizer.
- 25       93.    The nonwoven article of claim 77 wherein the polyolefin comprises a random copolymer comprising propylene and at least one other alpha-olefin.
- 30       94.    The nonwoven article of claim 77 wherein the polyolefin comprises a random copolymer comprising propylene and at least one other alpha-olefin selected from the group consisting of ethylene, butene, hexene, and octene.
95.    The nonwoven article of claim 77 wherein the polyolefin comprises homopolypropylene.

96. The nonwoven article of claim 77 wherein the polyolefin comprises polypropylene having a weight average molecular weight of from 10,000 to 400,000 and a molecular weight distribution of from 1 to 9.
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97. The nonwoven article of claim 77 wherein the polyolefin comprises polypropylene having a weight average molecular weight of from 40,000 to 300,000 and a molecular weight distribution of from 1 to 6.
- 10
98. The nonwoven article of claim 77 wherein the polyolefin comprises polypropylene having a weight average molecular weight of from 50,000 to 200,000 and a molecular weight distribution of from 1 to 4.
99. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has an  $M_n$  of 500 to 21,000.
- 15
100. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has a dielectric constant at 20 °C of less than 3.0.
101. The nonwoven article of claim 77 wherein the non-functionalized plasticizer has a specific gravity of less than 0.920.
- 20
102. The nonwoven article of claim 77 wherein wherein said article is clothing.
103. The nonwoven article of claim 77 wherein said article is packaging material.
- 25
104. The nonwoven article of claim 77 where the article is a surgical gown or drape.
- 30
105. The nonwoven article of claim 77 where the article is a package.

106. The nonwoven article of claim 77 where the article is a diaper.
107. The nonwoven article of claim 77 where the article is yarn.
- 5 108. The fiber of claim 41 where the fiber is meltblown.
109. The fiber of claim 41 where the fiber is spunbond.
110. The nonwoven article of claim 77 where the article comprises a  
10 bactericidal agent.
111. The nonwoven article of claim 77 where the article is selected from the  
group consisting of: yarns, woven fabrics, nonwoven fabrics, hook and  
loop fasteners, fabrics, garments, clothing, medical garments, surgical  
15 gowns, surgical drapes, diapers, training pants, sanitary napkins, panty  
liners, incontinent wear, bed pads, bags, packaging material, packages,  
swimwear, body fluid impermeable backsheets, body fluid impermeable  
layers, body fluid permeable layers, body fluid permeable covers,  
absorbents, tissues, nonwoven composites, liners, cloth linings, scrubbing  
20 pads, face masks, respirators, air filters, vacuum bags, oil and chemical  
spill sorbents, thermal insulation, first aid dressings, medical wraps,  
fiberfill, outerwear, bed quilt stuffing, furniture padding, filter media,  
scrubbing pads, wipe materials, hosiery, automotive seats, upholstered  
furniture, carpets, carpet backing, filter media, disposable wipes, diaper  
25 coverstock, gardening fabric, geomembranes, geotextiles, sacks,  
housewrap, vapor barriers, breathable clothing, envelopes, tamper evident  
fabrics, protective packaging, and coasters.
112. The nonwoven article of claim 77 where the article is selected from the  
30 group consisting of: fabrics, garments, clothing, medical garments,  
surgical gowns, surgical drapes, diapers, training pants, sanitary napkins,  
panty liners, incontinent wear, bed pads, bags, packaging material,

5 packages, swimwear, body fluid impermeable backsheets, body fluid impermeable layers, body fluid permeable layers, body fluid permeable covers, absorbents, tissues, nonwoven composites, liners, cloth linings, scrubbing pads, face masks, respirators, air filters, vacuum bags, oil and chemical spill sorbents, thermal insulation, first aid dressings, medical wraps, fiberfill, outerwear, bed quilt stuffing, furniture padding, filter media, scrubbing pads, wipe materials, hosiery, automotive seats, upholstered furniture, carpets, carpet backing, filter media, disposable wipes, diaper coverstock, gardening fabric, geomembranes, geotextiles, 10 sacks, housewrap, vaopr barriers, breathable clothing, envelopes, tamper evident fabrics, protective packaging, and coasters.

113. A fiber or nonwoven web comprising polypropylene and a non-functionalized plasticizer where the non-functionalized plasticizer 15 comprises oligomers of C<sub>5</sub> to C<sub>14</sub> olefins having a kinematic viscosity of 5 cSt or more at 100 °C and a viscosity index of 120 or more.

114. An article comprising the fiber or nonwoven web of claim 113 wherein the article is a fabric. 20

115. An article comprising the fiber or nonwoven web of claim 113 wherein the article is a non woven fabric.

116. The fiber or nonwoven web of claim 113 where the article is a surgical gown or drape. 25

117. The fiber or nonwoven web of claim 113 where the article is a diaper.

118. The fiber or nonwoven web of claim 113 where the article is clothing. 30

119. A diaper comprising sorbant and the fiber or nonwoven web of claim 113.

120. The nonwoven article of claim 77 wherein the polyolefin comprises polypropylene.